

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of	)	
	)	
Amendment of the Commission's Rules	)	WT Docket No. 01-90
Regarding Dedicated Short-Range	)	
Communication Services in the 5.850-	)	
5.925 GHz Band (5.9 GHz Band)	)	
	)	
Amendment of Parts 2 and 90 of the	)	ET Docket No. 98-95
Commission's Rules to Allocate the	)	RM-9096
5.850-5.925 GHz Band to the Mobile	)	
Service for Dedicated Short Range	)	
Communications of Intelligent	)	
Transportation Services	)	

**PETITION FOR RECONSIDERATION AND/OR CLARIFICATION  
OF ARINC, INCORPORATED**

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## SUMMARY

ARINC, Incorporated hereby submits this Petition for Reconsideration and/or Clarification of the *DSRC Report and Order*. In the *DSRC Report and Order*, the Commission took a milestone step forward by adopting licensing and service rules designed to achieve nationwide interoperability in the ITS infrastructure. ARINC commends the Commission for its leadership in, and continuing commitment to, the implementation of DSRC systems and ITS services that, most importantly, will protect the safety of life of the traveling public, improve mobility, and enhance economic activity and environmental quality. ARINC offers this Petition for Reconsideration and/or Clarification to request certain important refinements to the DSRC licensing and service rules to ensure that the rules establish a suitable RF environment in the 5.9 GHz band and thus promote a robust and interoperable deployment of DSRC services.

Specifically, ARINC urges the Commission to reconsider and/or clarify its rules in the following respects:

- The site registration process should include certain “active” spectrum management techniques. These techniques include a software-based advance site review analysis to identify potential harmful interference problems before new DSRC stations are deployed. ARINC also asks the Commission to address whether such modifications may be made to accommodate active registration within its ULS or, alternatively, to consider whether one or more third parties should be selected as the site registration database manager(s). These proposed rule refinements are intended to ensure that the site registration database includes complete, accurate, and up-to-date information and to provide a mechanism for identifying potential harmful interference between stations before they are deployed and begin operating.
- DSRC licensees should be required to commence operations on at least one site within 12 months of license grant and construct each registered site within 12 months after registration. Moreover, licensees should provide notice of when they have constructed and begun operations on their registered sites. Priority rights should attach on the date of construction notification, and not the date of registration in the database.

- Channel 172 should be designated for high-availability, low-latency safety communications. Channel 184 should be designated for longer-range, higher-power for public safety licensees.
- The Commission is requested to keep open Docket WT 01-90 for the submission and public consideration of several revisions to the ASTM DSRC Standard currently under development.

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To: The Commission

**PETITION FOR RECONSIDERATION AND/OR CLARIFICATION**

Pursuant to Section 1.429 of the Commission's rules, 47 C.F.R. § 1.429, ARINC, Incorporated ("ARINC"), by its counsel, respectfully petitions the Commission to reconsider and/or clarify certain of the licensing and service rules for the Dedicated Short Range Communications Service ("DSRCS") in the Intelligent Transportation Systems ("ITS") Radio Service in the 5.850-5.925 GHz band ("5.9 GHz Band") that were adopted in the *DSRC Report and Order* released February 10, 2004 in the above-captioned proceedings.<sup>1</sup>

**I. INTRODUCTION AND STATEMENT OF INTEREST**

ARINC is a world leader in the development and operation of communications and information processing systems, providing systems engineering and integration solutions to the

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<sup>1</sup> *Amendment of the Commission's Rules Regarding Dedicated Short-Range Communication Services in the 5.850-5.925 GHz Band (5.9 GHz Band)*, Report and Order, 19 FCC Rcd 2458 (2004) ("*DSRC Report and Order*"). The DSRC licensing and service rules are to become effective on October 4, 2004. 69 Fed. Reg. 46438 (Aug. 3, 2004).

government and transportation industry. Founded in 1929 to provide reliable and efficient radio communications for airlines, ARINC is headquartered in Annapolis, Maryland, and has over 80 locations worldwide.

ARINC participated in the proceedings to allocate the 5.9 GHz Band for DSRC in 1996 and 1997, and has continued to work with the wide range of government and private organizations that have been developing applicable standards and helping to define the service and licensing rules for DSRC that were adopted by the Commission in February 2004. Since 1997, ARINC has participated in the DSRC standards development process under the auspices of the American Society for Testing and Materials (“ASTM”) and the Institute of Electrical and Electronics Engineers (“IEEE”) and pursuant to a support contract from the U.S. Department of Transportation (“DOT”). In this role, ARINC chairs the ASTM E17.51 DSRC Standards Writing Group (“ASTM E17.51 Writing Group”), which developed the ASTM DSRC Standard. The instant Petition for Reconsideration and/or Clarification is submitted pursuant to ARINC’s role as a primary coordinator of the DSRC standards development process.

On February 10, 2004, the Commission adopted licensing and service rules for DSRC devices and systems operating in the 5.9 GHz Band. Consistent with Congress’s goal of a robust and interoperable deployment of ITS infrastructure, the Commission, most importantly, required all DSRC operations in the 5.9 GHz Band to comply with the ASTM-DSRC Standard.<sup>2</sup> The final rules also include a band channelization plan, licensing criteria and procedures, and

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<sup>2</sup> *DSRC Report and Order* ¶18. See American Society of Testing and Materials (ASTM), Standard Specification for Telecommunications and Information Exchange and Information Exchange Between Roadside and Vehicle Systems – 5 GHz Band Dedicated Short Range Communications (DSRC) Medium Access Control (MAC) and Physical Layer (PHY) Specifications, Designation: E 2213-03 (published Sept. 2003) (“ASTM-DSRC Standard”).

technical rules for DSRC equipment, Roadside Units (“RSUs”), and On-Board Units (“OBUs”), which will enable public safety and private licensees to share the full band. The *DSRC Report and Order* represents a critical step toward the deployment of DSRC services.

By this Petition, ARINC requests that the Commission reconsider or clarify certain provisions of the DSRC licensing and service rules to ensure that the rules promote a robust and interoperable deployment of DSRC services. ARINC seeks revision of the licensing and site registration procedures to provide an active registration model that will optimize frequency management in the 5.9 GHz Band and minimize any interference conflicts between DSRC systems. ARINC further requests clarification of the obligations of DSRC licensees to commence operations on their registered sites and seeks specific service channel designations for Channels 172 and 184.

## **II. REGISTRATION OF DSRC SITES SHOULD INCORPORATE ACTIVE FREQUENCY MANAGEMENT**

In the *DSRC Report and Order* the Commission elected to employ a geographic area licensing model incorporating the registration of specific sites by licensees in the Universal Licensing System (“ULS”).<sup>3</sup> This model is similar to that adopted by the Commission in WT Docket No. 02-146 for the licensing and service rules for the 71-76 GHz, 81-86 GHz, and 92-95 GHz bands.<sup>4</sup> In adopting this licensing model, the Commission considered the request of ITS America and others that it employ a traditional first come, first served site-specific licensing model, but concluded that “[G]iven the low power of RSUs, the interference-mitigation provisions of the ASTM-DSRC Standard, and that the potential number of sites could be in the

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<sup>3</sup> *DSRC Report and Order* ¶¶ 53-74.

<sup>4</sup> *Allocations and Service Rules for the 71-76 GHz, 81-86 GHz, and 92-95 GHz Bands*, Report and Order, 18 FCC Rcd 23318 (2003) (“*70-80-90 GHz Band Report and Order*”).

tens of thousands, we conclude that the burden and expense that site licensing . . . would impose on applicants and the Commission is unwarranted.”<sup>5</sup>

The Commission also declined to employ frequency coordination, concluding instead that the use of the ASTM-DSRC Standard by all those operating in the band will promote sharing between DSRC licensees, both public safety and non public safety, which makes formal frequency coordination unnecessary.<sup>6</sup> Licensees will also be authorized to operate across the full band, except in five megahertz of spectrum located at the lower end of the 5.9 GHz Band.<sup>7</sup> Authority to operate a specific RSU site commences upon the successful registration of that site into the database.<sup>8</sup> Licensees have 12 months after registration to construct and put into operation an RSU station.<sup>9</sup>

With the refinements suggested in its instant Petition, ARINC believes that geographic licensing with site registration will provide a positive and workable framework to support a robust and interoperable DSRC deployment. ARINC agrees with and appreciates the Commission’s concern for avoiding the imposition of unnecessary costs and administrative burdens on both applicants and scarce Commission resources. Because the geographic area licensing/site registration model is relatively new and untested, however, ARINC believes that

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<sup>5</sup> *DSRC Report and Order* ¶ 57.

<sup>6</sup> Any required coordination with the National Telecommunications and Information Administration (“NTIA”) of the U.S. Department of Commerce must also be conducted through the post-licensing registration process. *See DSRC Report and Order* ¶¶ 60, 73.

<sup>7</sup> *Id.*

<sup>8</sup> *Id.* ¶ 60. If a site requires prior NTIA coordination, operating authority does not attach until the NTIA has provided its approval. *Id.*

<sup>9</sup> *Id.* ¶ 83. More specifically, the construction deadline begins when the Commission’s Wireless Telecommunications Bureau has “posted” the RSU registration information on the ULS database. *Id.*



further consideration of the details of the registration process to be used with DSRC licensing is appropriate. In this respect, ARINC suggests that the rules should be refined to include certain advance “active” frequency management techniques to facilitate the establishment of a suitable radio frequency (“RF”) environment in the 5.9 GHz Band.

The registration database is intended to serve two practical functions. First, it provides basic information about registered sites so that applicants or licensees seeking to locate new RSU stations may determine what, if any, existing stations – DSRC or other incumbents in the 5.9 GHz Band – would be adjacent to a proposed station site. Second, the database establishes priority status rights for non-safety DSRC communications.<sup>10</sup> In other words, priority protection from interference is given to earlier registered sites.<sup>11</sup> If, for example, a later-registered site causes harmful interference to an earlier registered site, the later site must modify its operations to resolve the interference problem.<sup>12</sup> An accurate, complete, and comprehensive registration database is critical to enabling these functions. The site registration model as adopted, however, raises both procedural and technical concerns that may be addressed by refining the adopted rules.

Procedurally, the adopted site registration model can be deemed a “passive” process in that it incorporates none of the traditional spectrum management techniques long used by the Commission. For example, there is no prior frequency coordination, whether by software or human review, to determine whether a new RSU station site would likely cause harmful

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<sup>10</sup> The Commission established a separate hierarchy of priority rights whereby safety of life and public safety communications are to have access priority over non-public safety communications. *Id.* ¶¶ 31-34. Interference disputes involving safety of life and public safety communications are to be resolved using this same priority hierarchy. *Id.* ¶ 61.

<sup>11</sup> *Id.* ¶ 61.

<sup>12</sup> *Id.*

interference to incumbents if the proposed station is located and operated as proposed. There is no similar mechanism by which a coordinator could require a proposed location or operating characteristics (channels, power, etc.) to be changed to accommodate incumbents before a new site is deployed. The resolution of interference problems will occur after systems are deployed, raising costs and consuming more time – for licensees as well as the Commission – to resolve than if potential problems are spotted and prevented at the outset. Resolving interference problems “after-the-fact” is not the most efficient use of the Commission’s or licensees’ limited resources.

Any private entity can obtain a DSRC license, but there is not a “filter” mechanism in the Commission’s site registration model to ascertain whether an applicant is proposing a qualified service that is consistent with the Commission’s DSRC rules. Discovering and shutting down non-DSRC operations in the 5.9 GHz Band will likely occur only after such non-compliant systems are up and running and a complaint is brought before the Commission. Although the adopted rules require licensees to identify channels associated with a particular RSU station site, licensees may register for all channels in the 5.9 GHz Band rather than restrict their operations to a subset of channels. There will be a natural incentive for licensees to register for all channels to maximize their operating flexibility, even where there is no intent to utilize the full band. Thus, the registration database will fail to indicate the true operating characteristics of individual RSU stations.

An active site registration process will enable licensees to identify DSRC potential interference constraints and define mitigation parameters for both DSRC to DSRC interference and Other Device to DSRC interference. A passive site registration model implicates technical problems for locating DSRC RSUs in proximity to each other as well as locating DSRC RSUs

adjacent to fixed satellite services (“FSS”) earth stations. For example, a Performance Analysis and Simulations study showed that a significant decrease in control channel exchange success rate occurs from the interference generated when multiple RSUs operate in the same zone. In contrast, an active site registration process will enable DSRC licensees to identify the potential interference and define mitigation parameters such as interleaved Beacon timing, directive antennas, power control, and zone adjustment of the site.

Similarly, an active site registration process will be instrumental in mitigating interference generated by FSS earth stations operating in the extended C band. Active site registration will identify the potential for FSS interference by geographic site location and define mitigation methods such as the use of DSRC devices with Type 2 receiver channel rejection filters and alternate channel utilization. The maximum range of the FSS interference footprint was calculated during an FSS/DSRC Interference Study by using FSS earth station characteristics from the Commission’s data base combined with a DSRC link power budget with a noise adjusted receiver threshold level. This method, similar to the interactive method needed for active site registration, calculated the reduction in interference range achieved as a result of DSRC interference mitigation methods.

ARINC fully supports the goals behind adopting the site registration model: improving administrative efficiency and lowering the costs of licensing. However, ARINC believes that, with only modest revisions, the problems identified above can be remedied to ensure that a meaningful registration database is available to both the Commission and DSRC licensees. The proposed changes outlined below can be summarized as introducing certain “active” spectrum management techniques that are familiar to the Commission and the general wireless community.

These proposed changes should significantly reduce the likelihood that interference and other problems are discovered only after systems are deployed.

**A. Advance Site Review Analysis**

The adopted site registration model should include an advance site review analysis to assess the potential risk of interference from a proposed RSU station. For the most part, this analysis can be done through a software review. Licensees would enter their proposed site information in the registration database. The registration database software can be written to automatically identify potential conflicts with incumbent sites and, with further input, guide licensees away from potential conflicts. Only in rare occasions would human intervention be needed to resolve conflicts. In sum, such an advance site review analysis will preserve the flexibility of the nonexclusive, geographic licensing structure while making the site registration process more effective.

There is Commission precedent for a software-based advance site review process. For example, in the existing Wireless Medical Telemetry Service (“WMTS”),<sup>13</sup> licensees are required to enter into a common database the location (*e.g.*, hospital or other medical facility) and the type and number of wireless monitoring devices proposed to operate in that location. Via a software review, proposed sites and operating characteristics are vetted to minimize the potential for causing harmful interference to incumbent operators. Registrants have the option of requesting help at any time. Registration cannot be completed until and unless the proposed sites and operating characteristics are reviewed for potential interference. Registration in the database is required before service can be initiated.

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<sup>13</sup> See <http://www.ashe.org/ashe/currentevent/wmts/frequencycoorddatabase.html>.

The current DSRC site registration model follows closely the model adopted for point-to-point, fixed microwave services in the 71-76 GHz, 81-86 GHz, and 92-95 GHz bands (“70-80-90 GHz Bands”).<sup>14</sup> There, the Commission also adopted a “passive” registration model wherein there is no prior coordination or other “active” spectrum management steps taken during the registration process to minimize the potential for harmful interference from new sites. The band structure for the 70-80-90 GHz Bands is less complicated than for the DSRC operations in the 5.9 GHz Band. There will neither be public safety operations nor shared access to the band by public safety and non-public safety licensees. Only fixed operations will take place in the 70-80-90 GHz Bands. Nonetheless, an industry group advocating this new service, the Wireless Communications Association International (“WCAI”) is seeking Commission reconsideration of its rules to introduce similar “active” spectrum management techniques in the registration process for this band.<sup>15</sup>

ARINC, therefore, requests the Commission to reconsider and/or clarify its rules to include an advance site review analysis. Such a process should also include an eligibility “filter” whereby the applicant must make a showing that its proposed service qualifies as a DSRC service and will comply with the Commission’s rules and the ASTM DSRC Standard.

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<sup>14</sup> See *70-80-90 GHz Bands Report and Order*, 18 FCC Rcd at 2339-43, ¶¶ 48-60.

<sup>15</sup> See WCAI Petition for Reconsideration, *Allocations and Service Rules for the 71-76 GHz, 81-86 GHz, and 92-96 GHz*, WT Docket No. 02-146 (Feb. 23, 2004) (“*WCAI Petition*”). One of the entities, Comsearch, submitted a proposal to be a database manager and also advocated that an advance “interference harmonization” procedure be incorporated into the registration process for licensees in the 70-80-90 GHz Bands. See Comsearch Proposal, *Proposals to Develop and Manage an Independent Database of Site Registrations by Licensees in the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands*, WT Docket No. 02-146, Attachment 1 (Mar. 26, 2004).

## **B. Service Channel Registrations**

The ASTM DSRC Standard contemplates that licensees will use the Control Channel in connection with specific service channels for each RSU station. Conversely, the adopted rules appear to infer that service channel selection will be accomplished by DSRC devices scanning the full 5.9 GHz Band and choosing the best channel available at that time.<sup>16</sup> This apparent discrepancy must be resolved if a robust and interoperable deployment of DSRC services is to be achieved.

During an active site registration process, licensees could be directed to register for those Service Channels that would best serve their needs in their location. Licensees would then be limited to operating their systems in those specific Service Channels (in addition to the Control Channel).<sup>17</sup> DSRC OBUs would receive information to conduct the desired transaction in only those specified Service Channels when so directed by the RSU announcing the service. This is the channel operating structure contemplated by the ASTM DSRC Standard. Requiring licensees to designate specific Service Channels for RSUs will help ensure that the registration database more accurately reflects the true operating characteristics of individual sites than if licensees simply register for all service channels without regard to what channels will actually be used. More importantly, it will ensure that licensees will deploy and operate their DSRC systems in a manner that minimizes the potential for causing harmful interference.

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<sup>16</sup> See *DSRC Report and Order* ¶ 30.

<sup>17</sup> Licensees may be permitted to register for multiple Service Channels, as contemplated by the Commission's adopted rules, but should be prepared to make an appropriate showing of need.

### C. Third Party Database Manager(s)

The *DSRC Report and Order* specifies that licensees must register their sites in the Commission's ULS database.<sup>18</sup> The Commission noted, however, that there may be administrative benefits associated with having the registration process maintained by a third party and not the Commission.<sup>19</sup> It indicated a willingness to re-examine, after input from the U.S. Department of Transportation and the NTIA, whether it would be prudent to have the registration database housed outside of ULS.<sup>20</sup> Given the revisions to the registration process suggested herein, ARINC believes that there may be advantages to having one or more third parties maintain the registration database rather than the Commission.

Any further consideration of this issue must, of course, also address whether ULS may be revised to accommodate the active registration process contemplated herein. If this is not a practical solution, then ARINC urges the Commission to solicit comments and/or bids from qualified third parties to serve as the DSRCS database manager. Those parties should address the costs that would be associated with site registration. ARINC notes that third parties may be better able to create a more flexible database design to accommodate additional tasks. They may also be in a position to provide additional information and resources to support licensees. For the 70-80-90 GHz Bands, the Commission concluded that it would incur less administrative burden if one or more third parties maintained the registration database.<sup>21</sup> A single third party also maintains the database for the WMTS service.

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<sup>18</sup> *DSRC Report and Order* ¶ 59.

<sup>19</sup> *Id.*

<sup>20</sup> *Id.*

<sup>21</sup> *70-80-90 GHz Report and Order* ¶ 49.

### **III. CONSTRUCTION DEADLINE, NOTIFICATION, AND SITE PRIORITY RIGHTS**

In conjunction with adding the “active” spectrum management techniques discussed above, the adopted construction deadline rules should be clarified. In the *DSRC Report and Order*, the Commission adopted the requirement that RSU station sites must be constructed and put into operation within 12 months after registration in the ULS database.<sup>22</sup> According to the Commission, creating a maximum time limit for site construction will ensure that the registration database is current and complete.<sup>23</sup> The Commission, however, declined to require licensees to provide notification of when sites are constructed, relying instead on licensees to withdraw unconstructed or discontinued RSUs from the registration database.<sup>24</sup> Moreover, priority rights for protection against interference for non-public safety licensees are to attach on the date a site registration is “posted” in the database.<sup>25</sup> As adopted, there is concern that these rules may not realize the Commission’s goal of “maintain[ing] the integrity” of the registration database.<sup>26</sup> Another concern is that they may not appreciatively prevent licensees from “warehousing” sites and frequencies to the detriment of other licensees. ARINC, therefore, requests that these rules be reconsidered and/or clarified in a several respects as discussed below.

#### **A. Construction Deadline and Notification**

ARINC supports the adopted rule that specifies that registered sites must be constructed and placed into operation within 12 months after registration. This rule, however, should be clarified to require that licensees also provide notice to the registration database of the date a site

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<sup>22</sup> *DSRC Report and Order* ¶ 83.

<sup>23</sup> *Id.*

<sup>24</sup> *Id.* The Commission did, however, leave open the door to reconsider this conclusion. *Id.*

<sup>25</sup> *Id.* ¶ 61.



is constructed and placed into operation. This new requirement should help ensure that the database includes the most up-to-date and complete information available. Second, there should be an incentive for licensees to meet (and a resulting penalty for failing to do so) the 12-month construction deadline. For example, a licensee should be required to build at least one site within 12 months after grant of the license. Failure to do so should result in the loss of the license. In addition, if a licensee fails to construct a registered site within the 12-month deadline, the site registration should be automatically purged from the database. Failure to provide the notification of construction should also result in the site registration being purged from the database, although the licensee should be allowed to re-register its site thereafter. Proposed rule changes may be found in Appendix A attached hereto.

#### **B. Site Priority Rights**

Priority rights for protection from interference should attach on the date that construction notification is provided to the database and only for Service Channels 180, 181, and 182, on which construction is completed.<sup>27</sup> Attaching these rights at the date of registration appears to create a further incentive for licensees to register multiple sites to preserve maximum flexibility. Thus, sites would be unavailable to other licensees who may be in a better position to actually construct and operate from those stations. Attaching priority rights when a site is actually constructed should create incentives for licensees to build out and begin operating their stations. In other words, the sooner a site is up and running, the greater protection it will have against

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<sup>26</sup> *Id.* ¶ 83.

<sup>27</sup> Because Channels 174, 175, and 176 may operate at higher power under the ASTM-DSRC Standard, ARINC does not believe that site priority should attach to these Service Channels and that they are optimally used for applications that can accept sharing in this environment. In contrast, Channels 180, 181, and 182 will operate with lower power in more limited areas and

interference from later DSRC deployments. A proposed rule change is provided in Appendix A attached hereto.

#### **IV. UNIQUE IDENTIFIER FOR DUAL-BAND OPERATIONS**

Since the outset of efforts to develop the DSRC service, it has been envisioned that DSRC devices would be able to operate in the 5.9 GHz Band as well as in the adjacent Unlicensed National Information Infrastructure (“U-NII”) band at 5.725-5.825 GHz for Wi-Fi and other wireless broadband services. There is a concern, however, that such dual-band operations will increase the likelihood that unauthorized, non-DSRC services will be offered in the 5.9 GHz Band. Therefore, ARINC suggests that there should be a mechanism in the Commission’s rules by which dual-band DSRC devices would receive a unique identifier or other mechanism to be authorized and/or enabled to provide DSRC services in the 5.9 GHz Band.<sup>28</sup> Development of this concept is still in its early stages, but one possible suggestion is to assign a security code to an RSU at the time of purchase. A corollary code would subsequently be provided, perhaps during the licensing or site registration process, and a comparison of the two codes would permit the device to work in the 5.9 GHz Band. Additional details regarding this proposal are under development by the IEEE, and will be provided to the Commission within the next few months.

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are optimally used by DSRC applications that require a higher level of protection from interference.

<sup>28</sup> Any such identifier or code should not change the requirement that all DSRC devices be certified against and operate in accordance with the adopted ASTM DSRC Standard. *See DSRC Report and Order* ¶ 44.

## V. SERVICE CHANNEL DESIGNATIONS

Earlier proposals recommended that Channel 172 (5.855-5.865 GHz) be designated for high-availability, low-latency communications (especially for vehicle-to-vehicle safety communications for accident avoidance and mitigation) and that Channel 184 (5.915-5.925 GHz) be designated for high-power, longer-distance communications (especially for long range public safety applications and intersection collision mitigation).<sup>29</sup> In the *DSRC Report and Order*, the Commission denied these requests, holding that it was “premature” to specify channel assignments. Instead, the Commission concluded that channel designations are best determined by the Control Channel priority protocols developed by the Commission.<sup>30</sup> The Commission also remarked that the record exhibited nearly unanimous support that both public safety and non-public safety licensees should be authorized to share access to the full band.<sup>31</sup> This open channel structure, according to the Commission, would give DSRC licensees greater flexibility in designing their systems.<sup>32</sup> Since the release of the *DSRC Report and Order*, however, further consideration of these issues by the DSRC community supports the designation of Channel 172 and Channel 184, respectively, for high-availability, low-latency safety communications (Channel 172) and longer-range, high-power communications (Channel 184).

*Channel 172.* Ubiquitous deployment of vehicle-to-vehicle and vehicle-to/from-infrastructure safety applications on the Control Channel is not expected to occur immediately

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<sup>29</sup> Alliance of Automobile Manufacturers Comments, WT Docket No. 01-90, at 13 (Mar. 17, 2003); Intelligent Transportation Society of America (“ITS America”) Comments, WT Docket No. 01-90, at 21 (Mar. 17, 2003); ITS America *Ex Parte* Comments, WT Docket No. 01-90, at Appendix D (July 9, 2002).

<sup>30</sup> *DSRC Report and Order* ¶ 29.

<sup>31</sup> *Id.*

<sup>32</sup> *Id.*

due to the existing base of non-DSRC equipped vehicles. As more vehicles are equipped with DSRC devices, however, the number of vehicle-to-vehicle and vehicle-to-roadside safety communications, in conjunction with other uses, has the potential to overwhelm the capability of the Control Channel to support high-availability, low-latency safety communications. To plan for that eventuality, ARINC believes that some portion of the 5.9 GHz Band should be dedicated to high-availability, low-latency communications, such as vehicle safety applications, so that these communications can migrate away from the Control Channel, as necessary, if capacity limits on that channel are approached. This designated spectrum would be used, for example, by two vehicles on an imminent collision course to exchange vital information during the last 500 milliseconds before impact. Even if a collision could not be avoided, at a minimum, this information exchange could potentially allow the vehicles to better prepare (*i.e.*, extend bumpers, tighten seatbelts, etc.) to protect the occupants.

The design and manufacturing process for new vehicles and components requires significant advance planning, usually taking several years. Although vehicle manufacturers have already taken the initial steps to incorporate DSRC devices and services into their future vehicles, it is imperative that they know now that there will be sufficient communications capacity in the 5.9 GHz Band to support their future DSRC-based vehicle safety applications. Channel 172, therefore, should be designated as the high-availability, low-latency DSRC channel for effective support of vehicle safety and other high-priority vehicle safety and public safety applications. Such a designation will prevent lower priority transmissions from limiting the availability of this channel or increasing the latency of communications. It is important that such a designation be made now rather than later, after RSUs have been licensed and incumbent operations established in the channel. Designating Channel 172 for these purposes will also ensure that DSRC

licensees offering other services have greater access to other Service Channels without having to wait for numerous vehicle safety messages to cease transmission.

*Channel 184.* Channel 184 should be designated as the primary channel for high-power, coordinated RSU applications conducted by public safety licensees. (Non public safety licensees should be specifically authorized to use the channel, but with the understanding that they would need to accept interference from the high-power public safety applications.) Certain public safety applications will require higher power to transmit messages at greater distances. For example, it is envisioned that the 5.9 GHz Band will be used for “signal light preemption” applications for emergency and transit vehicles. In other words, the signal lights at an intersection can be turned to green or held green longer before an oncoming police car or bus, creating a “green wave” and allowing higher priority vehicles to reach their destination faster or maintain their route timing. Enabling this application to be initiated at greater distances is especially important for police, fire, medical, and other emergency vehicles as they may be traveling faster than normal traffic; thus it is important to maximize the time and distance from which a signal may be changed to green and an intersection cleared. Other intersection collision mitigation techniques require similar higher-power, longer-distance operating parameters.

ARINC, therefore, requests the Commission to reconsider and/or clarify its rules to designate Channel 172 for high-availability, low-latency safety communications and Channel 184 for longer-range, high-power communications.

## **VI. REVISIONS TO THE ASTM-DSRC STANDARD**

Although the Commission recognized that the ASTM-DSRC Standard would be revised in the future to reflect technological advances, it declined to implement an “automatic update”

procedure.<sup>33</sup> The stated reason for this decision was the concern regarding the “rigorous and detailed mandates” of the standard and how future revisions might affect a “widespread” incumbent base.<sup>34</sup> The Commission noted that it will consider future revisions to the standard as they become available.<sup>35</sup>

In response to the Commission’s adoption of the ASTM-DSRC Standard in February 2004, and other adopted licensing and service rules, the ASTM E17.51 Writing Group has prepared several revisions to the standard, including incorporating the Commission’s Control Channel priority protocol for public safety messages into the standard.<sup>36</sup> The proposed revisions to the standard include the following:

- To implement the Control Channel priority protocol by adding beacons and action frames (management frames) capability to DSRC devices. (Previously, DSRC devices were authorized to use only data frames.)
- To implement the Control Channel priority protocol by explicitly . . . that public safety messages have priority and the mechanism to do so.
- To implement the Control Channel priority protocol by further defining the usage and limitations of the Control Channel and Service Channels for public safety applications and private applications.
- To further define the channel switching of the Control Channel and Service Channels for public safety messages and private applications.
- To explicitly define that DSRC systems may have more than one DSRC device. This provides the capability of conducting extended application transactions on a Service Channel while continuing to monitor for (safety) messages on the Control Channel.

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<sup>33</sup> *DSRC Report and Order* ¶ 22.

<sup>34</sup> *Id.* In addition, the Commission accepted the suggestion that any revisions to the standard be “backwards compatible” to ensure the long-term stability of the standard. *Id.* ¶¶ 20, 22.

<sup>35</sup> *Id.* ¶ 22.

<sup>36</sup> *Id.* ¶¶ 30-34.

These revisions are expected to be voted on by ASTM members this Fall and published shortly thereafter. The revised standard will then be forwarded to the Commission. ARINC, therefore, requests that the Commission keep open this docket until after such time as the revised standard is submitted and the public is afforded an opportunity to review and comment on the revised ASTM DSRC Standard.

## **VII. ON BOARD UNITS**

In the *DSRC Report and Order*,<sup>37</sup> the Commission observed that there was contradictory information in the record concerning whether there would be a class of OBUs associated with specific RSUs. The Commission also considered the suggestions of several commenters that it license OBUs under an associated RSU license. The Commission decided, however, that it was more efficient to license OBUs by rule under Part 95 of its Rules. ARINC generally supports the use of licensing by rule for OBUs, as it will promote ubiquity in the deployment of DSRC devices.

Continuing industry discussions since the release of the *DSRC Report and Order* have highlighted the need for the establishment of a separate class of OBUs to be used exclusively by public safety eligibles, termed “public safety OBUs” or “PSOBUs.” PSOBUs are intended to provide public safety personnel operational flexibility in configuring capabilities in response to exigent situations without cost or delay otherwise attendant with the registration and construction of an RSU (which may not be mobile in any event). These PSOBUs are allowed by the ASTM-DSRC Standard to operate at higher power than other OBUs, may be operated while mobile as well as when stationary, and will be capable of transmitting beacons and actions frames to other OBUs to provide channel assignments and other instructions. ARINC, accordingly, requests that

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<sup>37</sup> *Id.* ¶ 63.

the Commission, on reconsideration of the *DSRC Report and Order* adopt the following definition of PSOBU in Section 90.375:

**Public Safety On Board Unit (PSOBU)**

A Public Safety On Board Unit is a DSRC transceiver that is normally mounted in or on a vehicle, or which may be portable, which is operated by an organization licensed as a public safety DSRC provider. Upon registration, a PSOBU is allowed to provide channel assignments and operating instructions to OBUs within the geographic area of its license on a temporary basis for a period not to exceed 72 continuous hours. A PSOBU may be registered for operations of longer durations subject to Section 90.375(b).

Such devices could be operated only by public safety entities on a temporary (*i.e.*, for less than 24 hours without a site registration), *ad hoc* basis. PSOBUs initially would be registered within the entire geographic area of the license held by the public safety eligible. This would enable operation at any site without specific site registration for up to 72 hours. For longer operation of PSOBUs, the public safety eligible could register the specific location (or area) within which the PSOBU would operate (and at that time be subject to the active frequency registration process). ARINC thus requests that the Commission make appropriate modifications on reconsideration of its *DSRC Report and Order* to its DSRC licensing and service rules to accommodate the use of PSOBUs by public safety eligibles.

**VIII. DSRC/FSS SPECTRUM SHARING PROTOCOLS**

ARINC also takes this opportunity to update the Commission regarding the on-going discussions between the DSRC and FSS industries. DSRC and FSS are co-primary in the 5.9 GHz Band. There are also significant FSS earth stations in the immediately adjacent band at 5.925-6.425 GHz. There is the potential that DSRC stations could suffer harmful interference from FSS stations. It is generally acknowledged that DSRC stations will not cause interference to FSS operations. The two industry groups initiated discussions to ascertain the potential for harmful interference and, it is hoped, develop a “sharing protocol” for DSRC and FSS operations



in the 5.9 GHz Band to be jointly presented to the Commission. In the *DSRC Report and Order*, the Commission instructed the industry groups to resolve these issues and took no position as to a preferred outcome.<sup>38</sup>

To update the Commission, technical studies, including interference analyses, have been largely completed. ARINC anticipates that discussions will continue on developing sound engineering practices for locating RSU sites to minimize the potential for harmful interference. Additional updates will be provided to the Commission as events warrant.

## IX. CONCLUSION

ARINC expresses its strong support for the Commission's adopted licensing and service rules for DSRC services in the 5.9 GHz Band. These rules represent a significant milestone for realizing a nationwide deployment of public safety and non public safety DSRC services. ARINC's proposed refinements to the Commission's adopted rules are being requested to ensure that this deployment is robust, comprehensive and interoperable as envisioned by Congress.

Respectfully submitted,  
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<sup>38</sup> *Id.* ¶ 80.

## APPENDIX A

Proposed amendments to Rule 90.155 (47 C.F.R. § 90.155):

(i) DSRC Roadside Units (RSUs) in the 5850-5925 MHz band –

(1) At least one (1) DSRC RSU must be placed in operation within 12 months from the date of grant of authorization (see § 90.149 of this part) or the license cancels automatically.

(2) DSRC RSUs must be placed in operation within 12 months from the date of their registration (see § 90.375 of this part) or the authority to operate the RSUs cancel automatically (see § 90.155 of this chapter). Such registration date(s) do not change the overall renewal period of the single license.

(3) Licensees must provide notification and certify to the Commission in accordance with § 1.946(d) of compliance with the 12 month construction period set forth in subsection (2), above. A failure to provide such notification shall result

Proposed amendments to Rule 90.377 (47 C.F.R. § 90.377):

(e) *Non-priority communications.* DSRC communications not listed in paragraph (d) are non-priority communications. If a dispute arises concerning non-priority communications, the licensee of the later-constructed RSU must accommodate the operation of the earlier constructed RSU, *i.e.*, interference protection rights are date-sensitive, based on the date that notification of construction of the RSU is provided (see § 90.155 of this part), and the later constructed RSU must modify its operations to resolve the dispute in accordance with paragraph (f).